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ALGEBRA.

181. Proposed by J. F. LAWRENCE, Breckenridge, Mo.

Show that $\phi(1)\frac{x}{1+x^2}-\phi(3)\frac{x^3}{1+x^6}+\phi(5)\frac{x^5}{1+x^{10}}-$ *ad inf.* $=\frac{x(1-x^2)}{(1+x^2)^2}$, $\phi(n)$ being the number of integers less than n and prime to it. [From Hall and Knight's *Higher Algebra*, page 358].

182. Proposed by J. F. LAWRENCE, Breckenridge, Mo.

Find the values of $x_1, x_2, x_3, \ldots x_n$ which satisfy the following system of simultaneous equations:

$$\frac{x_1}{a_1-b_1}+\frac{x_2}{a_1-b_2}+\ldots+\frac{x_n}{a_1-b_n}=1.$$

$$\frac{x_1}{a_2-b_1}-\frac{x_2}{a_2-b_2}+\ldots+\frac{x_n}{a_2-b_n}=1.$$

$$\ldots\quad\ldots\quad\ldots\quad\ldots\quad\ldots$$

$$\frac{x_1}{a_n-b_1}+\frac{x_2}{a_n-b_2}+\ldots+\frac{x_n}{a_n-b_n}=1.$$

GEOMETRY.

203. Proposed by W. J. GREENSTREET, A. M., Editor of The Mathematical Gazette, Stroud, Eng.

Show that two parabolae can always be drawn through the vertices of a triangle to touch its circumcircle at a vertex, and that the axes of these pairs of curves are orthogonal. Show that any triangle may be circumscribed by a conic so that the tangents at each vertex is parallel to the opposite side.

204. Proposed by ELMER SCHUYLER, B. Sc., Professor of German and Mathematics, Boys' High School, Reading, Pa.

Construct a triangle, having given an angle, the length of its bisector, and the sum of the including sides. [Phillips and Fisher].

CALCULUS.

168. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

The tangent of what Cartesian curve makes an x-intercept always m times as long as the corresponding y-intercept?

169. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

Find the value of y from the Eulerian equation

$$y=\int\frac{dx}{(x+\sqrt{3})\sqrt[3]{(x^2+1)}}.$$